

5 **POROUS GAS SENSORS AND METHOD OF PREPARATION THEREOF**

*This application is a DIV of 10/268,860 filed 10/10/2002, now
pat 6,673,644*

CROSS-REFERENCE TO RELATED APPLICATION

10 This application is a continuation-in-part application, which claims
priority to copending U.S. Utility Application entitled, "Enhancement, Stabilization and
Metallization of Porous silicon," having Serial No. 09/820,412, filed March 29, 2001,
which claims priority to copending U.S. Provisional Application entitled, "Novel Sensitive
Porous Silicon Gas Sensor," filed on October 10, 2001, and assigned Serial No. 60/328,583,
both of which are entirely incorporated herein by reference.

15 **TECHNICAL FIELD**

The present invention is generally related to porous silicon substrates and, more
particularly, is related to porous silicon sensors and methods of preparation thereof.

BACKGROUND OF THE INVENTION

20 High surface area porous silicon (PS) substrates formed in wafer scale through
electrochemical (EC) etching fall into two groups. PS substrates fabricated from aqueous
electrolytes consists of highly branched nonporous substrates while PS substrates
fabricated from a aqueous electrolyte are comprised of open and accessible macroporous
substrates with deep, wide, well-ordered channels.

25 High-surface area silicon substrates formed in wafer scale through etching display
a visible photoluminescence (PL) upon excitation with a variety of visible and ultraviolet
light sources. This room-temperature luminescence has attracted considerable attention
primarily because of its potential use in the development of silicon-based optoelectronics,
displays, and sensors.

30 Although the PL is thought to emanate from regions near the PS substrate surface,
the origin of the PL is the source of some controversy as the efficiency and wavelength